

SEQUENCE LISTING

(1) GENERAL INFORMATION:

(i) APPLICANT: Jay A. Fishman

(ii) TITLE OF INVENTION: MOLECULAR SEQUENCE OF SWINE RETROVIRUS
AND METHODS OF USE

(iii) NUMBER OF SEQUENCES: 74

(iv) CORRESPONDENCE ADDRESS:

(A) ADDRESSEE: LAHIVE & COCKFIELD, LLP
(B) STREET: 60 State Street
(C) CITY: Boston
(D) STATE: Massachusetts
(E) COUNTRY: USA
(F) ZIP: 02109-1875

(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: PatentIn Release #1.0, Version #1.25

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER:
(B) FILING DATE:

(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: US 08/572,645
(B) FILING DATE: 14-DEC-1995

(viii) ATTORNEY/AGENT INFORMATION:

(A) NAME: Louis Myers
(B) REGISTRATION NUMBER: 35,965
(C) REFERENCE/DOCKET NUMBER: MGP-038CP

(ix) TELECOMMUNICATION INFORMATION:

(A) TELEPHONE: (617) 227-7400
(B) TELEFAX: (617) 227-5941

(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 8060 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

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(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 7333 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

CTACCCCTGC GTGGTGTACG ACTGTGGGCC CCAGCGCGCT TGGAATAAAA ATCCTCTTGC	60
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CTGTTCTGAC TATTCGCCTC AGAATAGAAA CTCAGATGGA ACCTCCGGTT GCTATAGGAC	5520
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CCTCTGATTA CAATACAACC TCTGGATCAG TCCCCACTGA GCCTAACATC ACTATTAAAA	5640
CAGGGGCGAA ACTTTTTAGC CTCATCCAGG GAGCTTTCA AGCTCTAAC TCCACGACTC	5700
CAGAGGCTAC CTCTTCTTGT TGGCTTTGCT TAGCTTCGGG CCCACCTTAC TATGAGGGAA	5760
TGGCTAGAGG AGGGAAATTC AATGTGACAA AGGAACATAG AGACCAATGT ACATGGGAT	5820
CCCAAAATAA GCTTACCCCTT ACTGAGGTTT CTGGAAAAGG CACCTGCATA GGGATGGTTC	5880
CCCCATCCCA CCAACACCTT TGTAACCACA CTGAAGCCTT TAATCGAACC TCTGAGAGTC	5940
AATATCTGGT ACCTGGTTAT GACAGGTGGT GGGCATGTAA TACTGGATTA ACCCCTTGTG	6000
TTTCCACCTT GGTTTCAAC CAAACTAAAG ACTTTGCGT TATGGTCCAA ATTGTCCCC	6060
GGGTGTACTA CTATCCGAA AAAGCAGTCC TTGATGAATA TGACTATAGA TATAATCGGC	6120
CAAAAAGAGA GCCCATATCC CTGACACTAG CTGTAATGCT CGGATTGGGA GTGGCTGCAG	6180
GCGTGGGAAC AGGAACGGCT GCCCTAATCA CAGGACCGCA ACAGCTGGAG AAAGGACTTA	6240
GTAACCTACA TCGAATTGTA ACGGAAGATC TCCAAGCCCT AGAAAAATCT GTCAGTAACC	6300
TGGAGGAATC CCTAACCTCC TTATCTGAAG TGTTCTACA GAACAGAAGG GGGTTAGATC	6360
TGTTATTTCT AAAAGAAGGA GGGTTATGTG TAGCCTTAAA AGAGGAATGC TGCTTCTATG	6420
TAGATCACTC AGGAGCCATC AGAGACTCCA TGAGCAAGCT TAGAGAAAGG TTAGAGAGGC	6480
GTCGAAGGGA AAGAGAGGCT GACCAGGGT GGTTGAAGG ATGGTTCAAC AGGTCTCCTT	6540
GGATGACCAC CCTGCTTCT GCTCTGACGG GGCCCCTAGT AGTCCTGCTC CTGTTACTTA	6600
CAGTTGGGCC TTGCTTAATT AATAGGTTTGT TGCCCTTGT TAGAGAACGA GTGAGTGCAG	6660
TCCAGATCAT GGTACTTAGG CAACAGTACC AAGGCCCTCT GAGCCAAGGA GAAACTGACC	6720
TCTAGCCTTC CCAGTTCTAA GATTAGAACT ATTAACAAGA CAAGAAGTGG GGAATGAAAG	6780
GATGAAAATG CAACCTAACCC CTCCCAGAAC CCAGGAAGTT AATAAAAAGC TCTAAATGCC	6840
CCCGAATTCC AGACCCTGCT GGCTGCCAGT AAATAGGTAG AAGGTACACAC TTCCATTGT	6900
TCCAGGGCCT GCTATCCTGG CCTAAGTAAG ATAACAGGAA ATGAGTTGAC TAATCGCTTA	6960
TCTGGATTCT GTAAAATGCA CTGGCACCAT AGAAGAATTG ATTACACATT GACAGCCCTA	7020
GTGACCTATC TCAACTGCAA TCTGTCACTC TGCCCAGGAG CCCACGCAGA TGCGGACCTC	7080
CGGAGCTATT TTAAAATGAT TGGTCCACGG AGCGCGGGCT CTCGATATT TAAAATGATT	7140

GGTCCATGGA GCGCGGGCTC TCGATATTTT AAAATGATTG GTTTGTGACG CACAGGCTT	7200
GTTGTGAACC CCATAAAAGC TGTCGGATT CCGCACTCGG GGCCGCAGTC CTCTACCCCT	7260
GCGTGGTGTGTA CGACTGTGGG CCCCAGCGCG CTTGGAATAA AAATCCTCTT GCTGTTGCA	7320
TCAAAAAAAA AAA	7333

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 8132 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

GCGTGGTGTGTA CGACTGTGGG CCCCAGCGCG CTTGGAATAA AAATCCTCTT GCTGTTGCA	60
TCAAGACCGC TTCTCGTGAG TGATTAAGGG GAGTCGCCTT TTCCGAGCCT GGAGGTTCTT	120
TTTGCTGGTC TTACATTGGG GGGCTCGTCC GGGATCTGTC GCGGCCACCC CTAACACCCG	180
AGAACCGACT TGGAGGTAAA AAGGATCCTC TTTTAACGT GTATGCATGT ACCGGCCGGC	240
GTCTCTGTTC TGAGTGTCTG TTTTCAGTGG TGCGCGCTTT CGGTTTGCAG CTGTCCTCTC	300
AGGCCGTAAG GGCTGGGGGA CTGTGATCAG CAGACGTGCT AGGAGGATCA CAGGCTGCTG	360
CCCTGGGGGA CGCCCCGGGA GGTGAGGAGA GCCAGGGACG CCTGGTGGTC TCCTACTGTC	420
GGTCAGAGGA CGAATTCTG TTGCTGAAGC GAAAGCTTCC CCCTCCGCGA CCGTCCGACT	480
CTTTGCCTG CTTGTGGAAG ACGTGGACGG GTCACGTGTG TCTGGATCTG TTGGTTCTG	540
TTTTGTGTGT CTTGTCTTG TGTGTCTTG TCTACAGTTT TAATATGGGA CAGACGGTGA	600
CGACCCCTCT TAGTTGACT CTCGACCATT GGACTGAAGT TAAATCCAGG GCTCATATT	660
TGTCAGTTCA GGTTAAGAAG GGACCTTGGC AGACTTCTG TGTCTCTGAA TGGCCGACAT	720
TCGATGTTGG ATGGCCATCA GAGGGGACCT TTAATTCTGA GATTATCCTG GCTGTTAAAG	780
CAGTTATTT TCAGACTGGA CCCGGCTCTC ATCCCGATCA GGAGCCCTAT ATCCTTACGT	840
GGCAAGATTG GGCAGAGGAT CCTCCGCCAT GGGTTAAACC ATGGCTGAAT AAGCCAAGAA	900
AGCCAGGTCC CGAATTCTG GCTCTGGAG AGAAAAACAA ACACCTGGCT GAAAAAGTCA	960
AGCCCTCTCC TCATATCTAC CCCGAGATTG AGGAGCCACC GGCTTGGCCG GAACCCCAAT	1020

CTGTTCCCCC	ACCCCTTAT	CTGGCACAGG	GTGCCGCGAG	GGGACCCTTT	GCCCCCTCTG	1080
GAGCTCCGGC	GGTGGAGGGA	CCTGCTGCAG	GGACTCGGAG	CCGGAGGGGC	GCCACCCCGG	1140
AGCGGACAGA	CGAGATCGCG	ACATTACCGC	TGCGCACGTA	CGGCCCTCCC	ACACCGGGGG	1200
GCCAATTGCA	GCCCCTCCAG	TATTGCCCT	TTTCTTCTGC	AGATCTCTAT	AATTGGAAAA	1260
CTAACCATCC	CCCTTCTCG	GAGGATCCCC	AACGCCTCAC	GGGGTTGGTG	GAGTCCCTTA	1320
TGTTCTCTCA	CCAGCCTACT	TGGGATGATT	GTCAACAGCT	GCTGCAGACA	CTCTTCACAA	1380
CCGAGGAGCG	AGAGAGAATT	CTATTAGAGG	CTAGAAAAAA	TGTTCCCTGGG	GCCGACGGGC	1440
GACCCACGCG	GTTGCAAAAT	GAGATTGACA	TGGGATTTC	CTTAACTCGC	CCCGGTTGGG	1500
ACTACAACAC	GGCTGAAGGT	AGGGAGAGCT	TGAAAATCTA	TCGCCAGGCT	CTGGTGGCGG	1560
GTCTCCGGGG	CGCCTCAAGA	CGGCCCACTA	ATTTGGCTAA	GTAAAGAGAA	GTGATGCAGG	1620
GACCGAATGA	ACCCCCCTCT	GTTTTCTTG	AGAGGCTCTT	GGAAGCCTTC	AGGCGGTACA	1680
CCCCTTTGA	TCCCACCTCA	GAGGCCAAA	AAGCCTCAGT	GGCTTTGGCC	TTTATAGGAC	1740
AGTCAGCCTT	GGATATTAGA	AAGAAGCTTC	AGAGACTGGA	AGGGTTACAG	GAGGCTGAGT	1800
TACGTGATCT	AGTGAAGGAG	GCAGAGAAAG	TATATTACAA	AAGGGAGACA	GAAGAAGAAA	1860
GGGAACAAAG	AAAAGAGAGA	GAAAGAGAGG	AAAGGGAGGA	AAGACGTAAT	AAACGGCAAG	1920
AGAAGAATT	GACTAAGATC	TTGGCTGCAG	TGGTTGAAGG	GAAAAGCAAT	ACGGAAAGAG	1980
AGAGAGATT	TAGGAAAATT	AGGTCAAGGCC	CTAGACAGTC	AGGGAACCTG	GGCAATAGGA	2040
CCCCACTCGA	CAAGGACCAA	TGTGCATATT	GTAAAGAAAG	AGGACACTGG	GCAAGGAACT	2100
GCCCCAAGAA	GGGAAACAAA	GGACCAAGGA	TCCTAGCTCT	AGAAGAAGAT	AAAGATTAGG	2160
GGAGACGGGG	TTCGGACCCC	CTCCCCGAGC	CCAGGGTAAC	TTTGAAGGTG	GAGGGGCAAC	2220
CAGTTGAGTT	CCTGGTTGAT	ACCGGAGCGA	AACATTCACT	GCTACTACAG	CCATTAGGAA	2280
AACTAAAAGA	TAAAAAATCC	TGGGTGATGG	GTGCCACAGG	GCAACAACAG	TATCCATGGA	2340
CTACCCGAAG	AACAGTTGAC	TTGGGAGTGG	GACGGGTAAC	CCACTCGTT	CTGGTCATAC	2400
CTGAGTGCC	AGCACCCCTC	TTAGGTAGAG	ACTTATTGAC	CAAGATGGGA	GCACAAATT	2460
CTTTTGAACA	AGGGAAACCA	GAAGTGTCTG	CAAATAACAA	ACCTATCACT	GTGTTGACCC	2520
TCCAATTAGA	TGACGAATAT	CGACTATACT	CTCCCCTAGT	AAAGCCTGAT	CAAATATAC	2580
AATTCTGGTT	GGAACAGTTT	CCCCAAGCCT	GGGCAGAAAC	CGCAGGGATG	GGTTTGGCAA	2640
AGCAAGTTC	CCCACAAGTT	ATTCAACTGA	AGGCCAGTGC	CACACCAGTG	TCAGTCAGAC	2700
AGTACCCCTT	GAGTAAAGAA	GCTCAAGAAG	GAATTCGGCC	GCATGTCCAA	AGATTAATCC	2760

AACAGGGCAT CCTAGTCCT GTCCAATCTC CCTGGAATAC TCCCCTGCTA CCGGTTAGAA	2820
AGCCTGGAC TAATGACTAT CGACCAGTAC AGGACTTGAG AGAGGTCAAT AAACGGGTGC	2880
AGGATATACA CCCAACAGTC CCGAACCTT ATAACCTCTT GTGTGCTCTC CCACCCCCAAC	2940
GGAGCTGGTA TACAGTATTG GACTTAAAGG ATGCCTTCTT CTGCCTGAGA TTACACCCCA	3000
CTAGCCAACC ACTTTTGCC TTCGAATGGA GAGATCCAGG TACGGGAAGA ACCGGGCAGC	3060
TCACCTGGAC CCGACTGCC CAAAGGTTCA AGAACTCCCC GACCATCTT GACGAAGCCC	3120
TACACAGAGA CCTGGCCAAC TTCAGGATCC AACACCCCTCA GGTGACCCCTC CTCCAGTACG	3180
TGGATGACCT GCTTCTGGCG GGAGCCACCA AACAGGACTG CTTAGAAGGC ACGAAGGCAC	3240
TACTGCTGGA ATTGTCTGAC CTAGGCTACA GAGCCTCTGC TAAGAAGGCC CAGATTGCA	3300
GGAGAGAGGT AACATACTTG GGGTACAGTT TCGGGGACGG GCAGCGATGG CTGACGGAGG	3360
CACGGAAGAA AACTGTAGTC CAGATAACCGG CCCCAACCAC AGCCAAACAA ATGAGAGAGT	3420
TTTGGGGAC AGCTGGATTT TGCAGACTGT GGATCCGGG GTTTGCGACC TTAGCAGCCC	3480
CACTCTACCC GCTAACCAAA GAAAAAGGGG AATTCTCCTG GGCTCCTGAG CACCAGAAGG	3540
CATTTGATGC TATCAAAAG GCCCTGCTGA GCGCACCTGC TCTGGCCCTC CCTGACGTAA	3600
CTAAACCCTT TACCTTTAT GTGGATGAGC GTAAGGGAGT AGCCCGGGGA GTTTAACCC	3660
AAACCCCTAGG ACCATGGAGA AGACCTGTG CCTACCTGTC AAAGAAGCTC GATCCTGTAG	3720
CCAGTGGTTG GCCCATATGC CTGAAGGCTA TCGCAGCTGT GGCCATACTG GTCAAGGACG	3780
CTGACAAATT GACTTGGGA CAGAATATAA CTGTAATAGC CCCCCATGCA TTGGAGAACAA	3840
TCGTTGGCA GCCCCCAGAC CGATGGATGA CCAACGCCCG CATGACCCAC TATCAAAGCC	3900
TGCTTCTCAC AGAGAGGGTC ACGTTCGCTC CACCAGCCGC TCTCAACCCT GCCACTCTTC	3960
TGCCTGAAGA GACTGATGAA CCAGTGACTC ATGATTGCCA TCAACTATTG ATTGAGGAGA	4020
CTGGGGTCCG CAAGGACCTT ACAGACATAC CGCTGACTGG AGAAGTGCTA ACCTGGTTCA	4080
CTGACGGAAG CAGCTATGTG GTGGAAGGTA AGAGGATGGC TGGGGCGGCG GTGGTGGACG	4140
GGACCCGCAC GATCTGGCC AGCAGCCTGC CGGAAGGAAC TTCAGCACAA AAGGCTGAGC	4200
TCATGGCCCT CACGCAAGCT TTGCGGCTGG CCGAAGGGAA ATCCATAAAC ATTTATACGG	4260
ACAGCAGGTA TGCCTTGCG ACTGCACACG TACATGGGGC CATCTATAAA CAAAGGGGT	4320
TGCTTACCTC AGCAGGGAGG GAAATAAAGA ACAAAAGAGGA AATTCTAAGC CTATTAGAAG	4380
CCGTACATTT ACCAAAAAGG CTAGCTATTA TACACTGTCC TGGACATCAG AAAGCTAAAG	4440
ATCTCATATC CAGAGGAAAC CAGATGGCTG ACCGGGTTGC CAAGCAGGCA GCCCAGGGTG	4500

TTAACCTTCT GCCTATAATA GAAATGCCCA AAGCCCCAGA ACCCAGACGA CAGTACACCC	4560
TAGAAGACTG GCAAGAGATA AAAAAGATAG ACCAGTTCTC TGAGACTCCG GAAGGGACCT	4620
GCTATACCTC AGATGGGAAG GAAATCCTGC CCCACAAAGA AGGGTTAGAA TATGTCCAAC	4680
AGATAACATCG TCTAACCCAC CTAGGAACTA AACACCTGCA GCAGTTGGTC AGAACATCCC	4740
CTTATCATGT TCTGAGGCTA CCAGGAGTGG CTGACTCGGT GGTCAAACAT TGTGTGCCCT	4800
GCCAGCTGGT TAATGCTAAT CCTTCCAGAA TGCCCTCCAGG GAAGAGACTA AGGGGAAGCC	4860
ACCCAGGCGC TCACTGGGAA GTGGACTTCA CTGAGGTAAA GCCGGCTAAA TACGGAAACA	4920
AATAACCTATT GGTTTTGTA GACACCTTTT CAGGATGGGT AGAGGCTTAT CCTACTAAGA	4980
AAGAGACTTC AACCGTGGTG GCTAAAAAAA TACTGGAAGA AATTTTCCA AGATTTGGAA	5040
TACCTAAGGT AATAGGGTCA GACAATGGTC CAGCTTTGT TGCCCAGGTA AGTCAGGGAC	5100
TGGCCAAGAT ATTGGGGATT GATTGGAAAC TGCATTGTGC ATACAGACCC CAAAGCTCAG	5160
GACAGGTAGA GAGGATGAAT AGAACCATTA AAGAGACCCCT TACTAAATTG ACCGGGAGA	5220
CTGGCGTTAA TGATTGGATA GCTCTCCTGC CCTTTGTGCT TTTTAGGGTT AGGAACACCC	5280
CTGGACAGTT TGGGCTGACC CCCTATGAAT TACTCTACGG GGGACCCCCC CCATTGGTAG	5340
AAATTGCTTC TGTACATAGT GCTGACGTGC TGCTTCCCA GCCTTGTTC TCTAGGCTCA	5400
AGGCACTTGA GTGGGTGAGA CAACGAGCGT GGAGGCAACT CCGGGAGGCC TACTCAGGAG	5460
GAGGAGACTT GCAGATCCCA CATCGTTCC AAGTGGGAGA TTCAGTCTAC GTTAGACGCC	5520
ACCGTGCAGG AAACCTCGAG ACTCGGTGGA AGGGCCCTTA TCTCGTACTT TTGACCACAC	5580
CAACGGCTGT GAAAGTCGAA GGAATCTCCA CCTGGATCCA TGCATCCCAC GTTAAACCGG	5640
CGCCACCTCC CGATTGGGG TGAAAGCCG AAAAGACTGA AAATCCCCTT AAGCTTCGCC	5700
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GACAGCCTGA ACTCCCATAA ACCCTTATCT CTCACCTGGT TAATTACTGA CTCCGGCACA	5820
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TACGTTTGCC TCAGATCAGT TATTCCTAGT CTGACCTCAC CCCCCAGATAT CCTCCATGCT	5940
CACGGATTT ATGTTGCCA AGGACCACCA AATAATGGAA AACATTGCCG AAATCCCAGA	6000
GATTCTTT GTAAACAATG GAACTGTGTA ACCTCTAATG ATGGATATTG GAAATGGCCA	6060
ACCTCTCAGC AGGATAGGGT AAGTTTTCT TATGTCAACA CCTATACCAAG CTCTGGACAA	6120
TTAATTACC TGACCTGGAT TAGAACTGGA AGCCCCAAGT GCTCTCCTTC AGACCTAGAT	6180
TACCTAAAAA TAAGTTTCAC TGAGAAAGGA AAACAAGAAA ATATCCTAAA ATGGTAAAT	6240

GGTATGTCTT GGGGAATGGT ATATTATGGA GGCTCGGGTA AACAAACCAGG CTCCATTCTA 6300
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TCAGACCCCCA CTGAGTCTAA CAGCACGACT AAAATGGGGG CAAAACCTTT TAGCCTCATC 6480
CAGGGAGCTT TTCAAGCTCT TAACTCCACG ACTCCAGAGG CTACCTCTTC TTGTTGGCTA 6540
TGCTTAGCTT CGGGCCACC TTACTATGAA GGAATGGCTA GAAGAGGGAA ATTCAATGTG 6600
ACAAAAGAAC ATAGAGACCA ATGCACATGG GGATCCAAA ATAAGCTTAC CCTTACTGAG 6660
GTTTCTGGAA AAGGCACCTG CATAGGAAAG GTTCCCCAT CCCACCAACA CCTTTGTAAC 6720
CACACTGAAG CCTTTAATCA AACCTCTGAG AGTCAATATC TGGTACCTGG TTATGACAGG 6780
TGGTGGCAT GTAATACTGG ATTAACCCCT TGTGTTCCA CCTTGGTTT TAACCAAAC 6840
AAAGATTTT GCATTATGGT CCAAATTGTT CCCCAGTGT ATTACTATCC CGAAAAGCA 6900
ATCCTTGATG AATATGACTA CAGAAATCAT CGACAAAAGA GAGAACCCAT ATCTCTGACA 6960
CTTGCTGTGA TGCTCGGACT TGGAGTGGCA GCAGGTGTAG GAACAGGAAC AGCTGCCCTG 7020
GTCACGGGAC CACAGCAGCT AGAAACAGGA CTTAGTAACC TACATCGAAT TGTAACAGAA 7080
GATCTCCAAG CCCTAGAAAA ATCTGTCAGT AACCTGGAGG AATCCCTAAC CTCCTTATCT 7140
GAAGTAGTCC TACAGAATAG AAGAGGGTTA GATTTATTAT TTCTAAAAGA AGGAGGATTA 7200
TGTGTAGCCT TGAAGGAGGA ATGCTGTTT TATGTGGATC ATTCAAGGGC CATCAGAGAC 7260
TCCATGAACA AGCTTAGAGA AAGGTTGGAG AAGCGTCGAA GGGAAAAGGA AACTACTCAA 7320
GGGTGGTTTG AGGGATGGTT CAACAGGTCT CTTTGGTTGG CTACCCCTACT TTCTGCTTTA 7380
ACAGGACCCCT TAATAGTCCT CCTCCTGTTA CTCACAGTTG GGCCATGTAT TATTAACAAG 7440
TTAATTGCCT TCATTAGAGA ACCAATAAGT GCAGTCCAGA TCATGGTACT TAGACAACAG 7500
TACCAAAGCC CGTCTAGCAG GGAAGCTGGC CGCTAGCTCT ACCAGTTCTA AGATTAGAAC 7560
TATTAACAAG AGAAGAAGTG GGGATGAAA GGATGAAAAT ACAACCTAAC CTAATGAGAA 7620
GCTTAAAATT GTTCTGAATT CCAGAGTTG TTCCTTATAG GTAAAAGATT AGGTTTTTG 7680
CTGTTTAAA ATATGCGGAA GTAAAATAGG CCCTGAGTAC ATGTCTCTAG GCATGAAACT 7740
TCTTGAAACT ATTTGAGATA ACAAGAAAAG GGAGTTCTA ACTGCTTGGT TAGCTTCTGT 7800
AAAACGGTT GCGCCATAAA GATGTTGAAA TGTTGATACA CATATCTTGG TGACAACATG 7860
TCTCCCCAC CCCGAAACAT GCGCAAATGT GTAACTCTAA AACAAATTAA ATTAATTGGT 7920
CCACGAAGCG CGGGCTCTCG AAGTTTAAA TTGACTGGTT TGTGATATT TGAAATGATT 7980

GGTTTGTAAA GCGCGGGCTT TGTTGTGAAC CCCATAAAAG CTGTCCCGAC TCCACACTCG 8040
GGGCCGCAGT CCTCTACCCC TGC GTGGTGT ACGACTGTGG GCCCCAGCGC GCTTGGAAATA 8100
AAAATCCTCT TGCTGTTGC ATCAAAAAAA AA 8132

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

TGCCTAGAGA CATGTACTC 19

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 21 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

CCTCTTCTAG CCATTCCTTC A 21

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 22 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

TCGAGACTCG GTGGAAGGGC CC 22

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 22 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

GGGCCCTTCC ACCGAGTCTC GA

22

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

ACCTGGATCC ATGCATCCCA CG

22

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

CGTGGGATGC ATGGATCCAG GT

22

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

GGCGCCACCT CCCGATTCTGG

20

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

CCGAATCGGG AGGTGGCGCC

20

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

TCCCCCTTAAG CTTCGCCTCC

20

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

GGAGGGCGAAG CTTAAGGGGA

20

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 23 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

AAAAGCACAA AGGGCAGGAG AGC

23

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

GCTCTCCTGC CCTTTGTGCT TTT

23

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

CCTTTAGGAA CCTGGTGGCC

20

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

GGCCACCAGG TTCCTAAAGG

20

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

CCCCCAGATA TCCTCCATGC

20

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

GCATGGAGGA TATCTGGGGG

20

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

GCAGTTCCA ATCAATCCCC AA

22

(2) INFORMATION FOR SEQ ID NO:21:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

TTGGGGATTG ATTGGAACT GC

22

(2) INFORMATION FOR SEQ ID NO:22:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

TTTATGTTTG CCCAGGACCA CCA

23

(2) INFORMATION FOR SEQ ID NO:23:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

TGGTGGTCCT GGGCAACAT AAA

23

(2) INFORMATION FOR SEQ ID NO:24:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

GGGAGGTGGC GCCGGCTTAA CGT

23

(2) INFORMATION FOR SEQ ID NO:25:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

ACGTTAAGCC GGCGCCACCT CCC

23

(2) INFORMATION FOR SEQ ID NO:26:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

CCCCCAACCC AAGGACCAGG ACCA

24

(2) INFORMATION FOR SEQ ID NO:27:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

TGGTCCTGGT CCTTGGGTTG GGGG

24

(2) INFORMATION FOR SEQ ID NO:28:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

GCAGCACGAC TAAAATGGGG GC

22

(2) INFORMATION FOR SEQ ID NO:29:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs

- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

CCCCCCATTT TAGTCGTGCT GC

22

(2) INFORMATION FOR SEQ ID NO:30:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

CCCCCATCCC ACCAACACCT

20

(2) INFORMATION FOR SEQ ID NO:31:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

AGGTGTTGGT GGGATGGGGG

20

(2) INFORMATION FOR SEQ ID NO:32:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

TCTCCCCAC CCCGAAACAT

20

(2) INFORMATION FOR SEQ ID NO:33:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

ATGTTTCGGG GTGGGGGAGA

20

(2) INFORMATION FOR SEQ ID NO:34:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

AGCCAAGAAA GCCAGGTCCC CGAA

24

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

TTCGGGGACC TGGCTTTCTT GGCT

24

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

AGGCTCTGGT GGCGGGTCTC C

21

(2) INFORMATION FOR SEQ ID NO:37:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

GGAGACCCGC CACCAAGAGCC T

21

(2) INFORMATION FOR SEQ ID NO:38:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

CCGCAGGGAT GGGTTTGGCA

20

(2) INFORMATION FOR SEQ ID NO:39:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

TGCCAAACCC ATCCCTGCGG

20

(2) INFORMATION FOR SEQ ID NO:40:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

GCTCACCTGG ACCCGACTGC CC

22

(2) INFORMATION FOR SEQ ID NO:41:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

GGGCAGTCGG GTCCAGGTGA GC

22

(2) INFORMATION FOR SEQ ID NO:42:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

GTTTACGGGA CGGGCAGCGA TGGC

24

(2) INFORMATION FOR SEQ ID NO:43:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

GCCATCGCTG CCCGTCCCGT AAAC

24

(2) INFORMATION FOR SEQ ID NO:44:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

TGGCTGGGGC GGCGGTGGTG GACGGG

26

(2) INFORMATION FOR SEQ ID NO:45:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

CCCGTCCACC ACCGCCGCC CAGCCA

26

(2) INFORMATION FOR SEQ ID NO:46:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

GCCCAAAGCC CCAGAACCCA GACG

24

(2) INFORMATION FOR SEQ ID NO:47:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

CGTCTGGGTT CTGGGGCTTT GGGC

24

(2) INFORMATION FOR SEQ ID NO:48:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

GATGAAACAGG CAGACATCTG

20

(2) INFORMATION FOR SEQ ID NO:49:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

CGCTTACAGA CAAGCTGTGA

20

(2) INFORMATION FOR SEQ ID NO:50:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

AGAACAAAGG CTGGGAAGC

19

(2) INFORMATION FOR SEQ ID NO:51:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

ATAGGAGACA GCCTGAACTC

20

(2) INFORMATION FOR SEQ ID NO:52:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

GGACCATTGT CTGACCCTAT

20

(2) INFORMATION FOR SEQ ID NO:53:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

GTCAACACCT ATACCAGCTC

20

(2) INFORMATION FOR SEQ ID NO:54:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

CATCTGAGGT ATAGCAGGTC

20

(2) INFORMATION FOR SEQ ID NO:55:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

GCAGGTGTAG GAACAGGAAC

20

(2) INFORMATION FOR SEQ ID NO:56:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

ACCTGTTGAA CCATCCCTCA

20

(2) INFORMATION FOR SEQ ID NO:57:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

CGAATGGAGA GATCCAGGTA

20

(2) INFORMATION FOR SEQ ID NO:58:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs

- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

CCTGCATCAC TTCTCTTACC

20

(2) INFORMATION FOR SEQ ID NO:59:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

TTGCCTGCTT GTGGAATACG

20

(2) INFORMATION FOR SEQ ID NO:60:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

CAAGAGAAGA AGTGGGGAAT G

21

(2) INFORMATION FOR SEQ ID NO:61:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

CACAGTCGTA CACCACGCAG

20

(2) INFORMATION FOR SEQ ID NO:62:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

GGGAGACAGA AGAAGAAAGG

20

(2) INFORMATION FOR SEQ ID NO:63:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

CGATAGTCAT TAGTCCCAGG

20

(2) INFORMATION FOR SEQ ID NO:64:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 21 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:64:

TGCTGGTTTG CATCAAGACC G

21

(2) INFORMATION FOR SEQ ID NO:65:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:65:

GTCGCAAAGG CATAACCTGCT

20

(2) INFORMATION FOR SEQ ID NO:66:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:66:

ACAGAGCCTC TGCTAAGAAG

20

(2) INFORMATION FOR SEQ ID NO:67:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:67:

GCAGCTGTTG ACAATCATC

19

(2) INFORMATION FOR SEQ ID NO:68:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:68:

TATGAGGAGA GGGCTTGACT

20

(2) INFORMATION FOR SEQ ID NO:69:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:69:

AGCAGACGTG CTAGGAGGT

19

(2) INFORMATION FOR SEQ ID NO:70:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:70:

TCCTCTTGCT GTTTGCATC

19

(2) INFORMATION FOR SEQ ID NO:71:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:71:

CAGACACTCA GAACAGAGAC

20

(2) INFORMATION FOR SEQ ID NO:72:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:72:

ACATCGTCTA ACCCACCTAG

20

(2) INFORMATION FOR SEQ ID NO:73:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:73:

CTCGTTTCTG GTCATACCTG A

21

(2) INFORMATION FOR SEQ ID NO:74:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:74:

GAGTACATCT CTCTAGGCA

19